

# **MERCURY IN FISH AND SHELLFISH**

## **IN THE SACRAMENTO RIVER AND NORTHERN DELTA**

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**“OEHHA”**

**Office of Environmental Health Hazard Assessment  
California Environmental Protection Agency**

# Topics for Today

- Background -- Review
  - Fish Mercury Project (FMP) and study areas
  - San Joaquin River and South Delta draft advisories
  - Health benefits and risks from eating fish
- Mercury in fish and shellfish from the Sacramento River and Northern Delta
- Draft safe eating guidelines for the Sacramento River and Northern Delta

# Fish Mercury Project

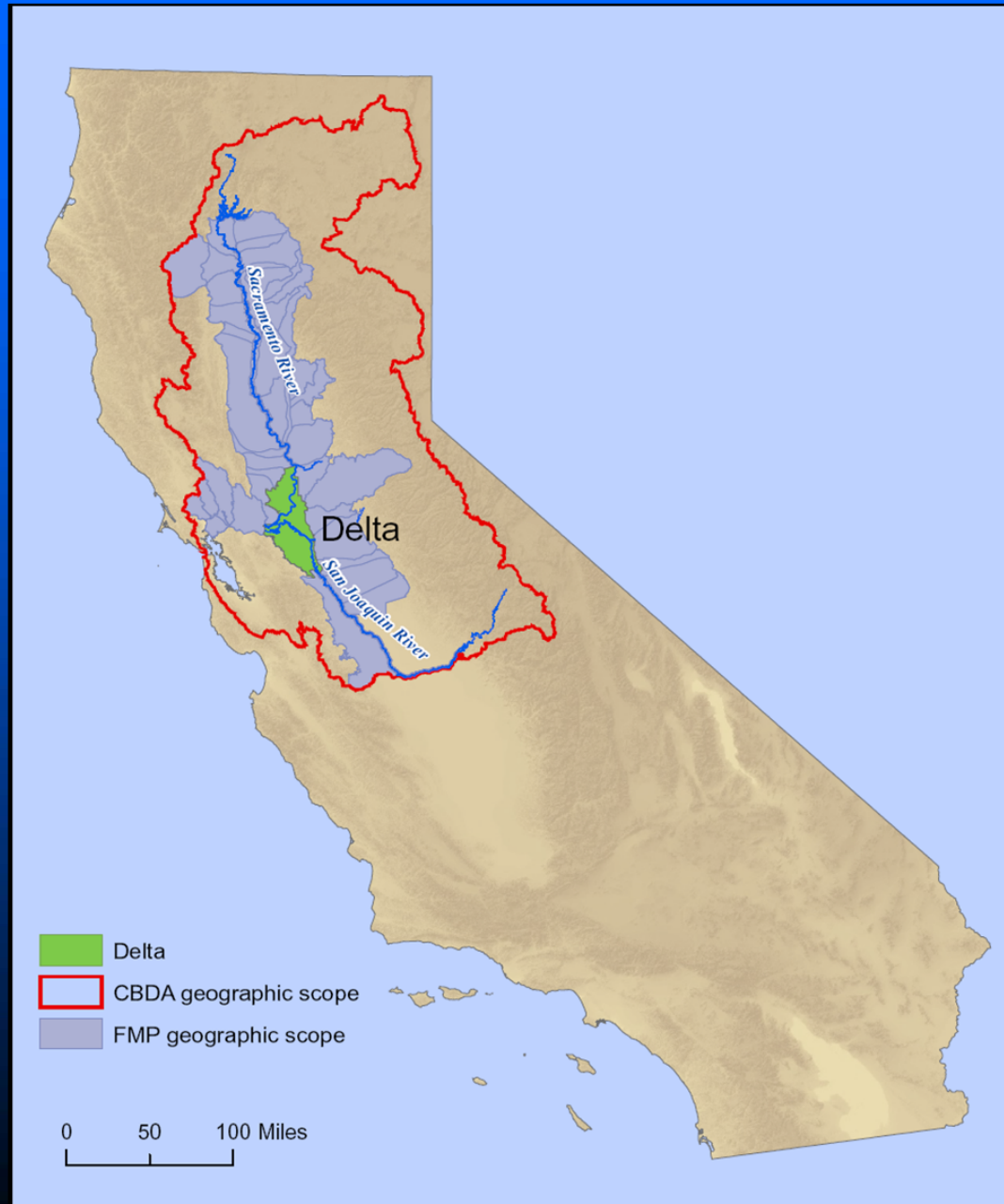


## The LSAG

# **Fish Mercury Project**

- **Primary goal: protect human health**
  - **Measure mercury levels**
  - **Assess health risks and benefits from eating fish**
  - **Develop safe eating guidelines**
  - **Communicate with fish consumers**
    - » **With help from community leaders and county health staff**

# Map of California Showing the Delta and FMP Area



# FMP Study Areas

2005: San Joaquin River and South Delta

2006: Sacramento River and Northern Delta

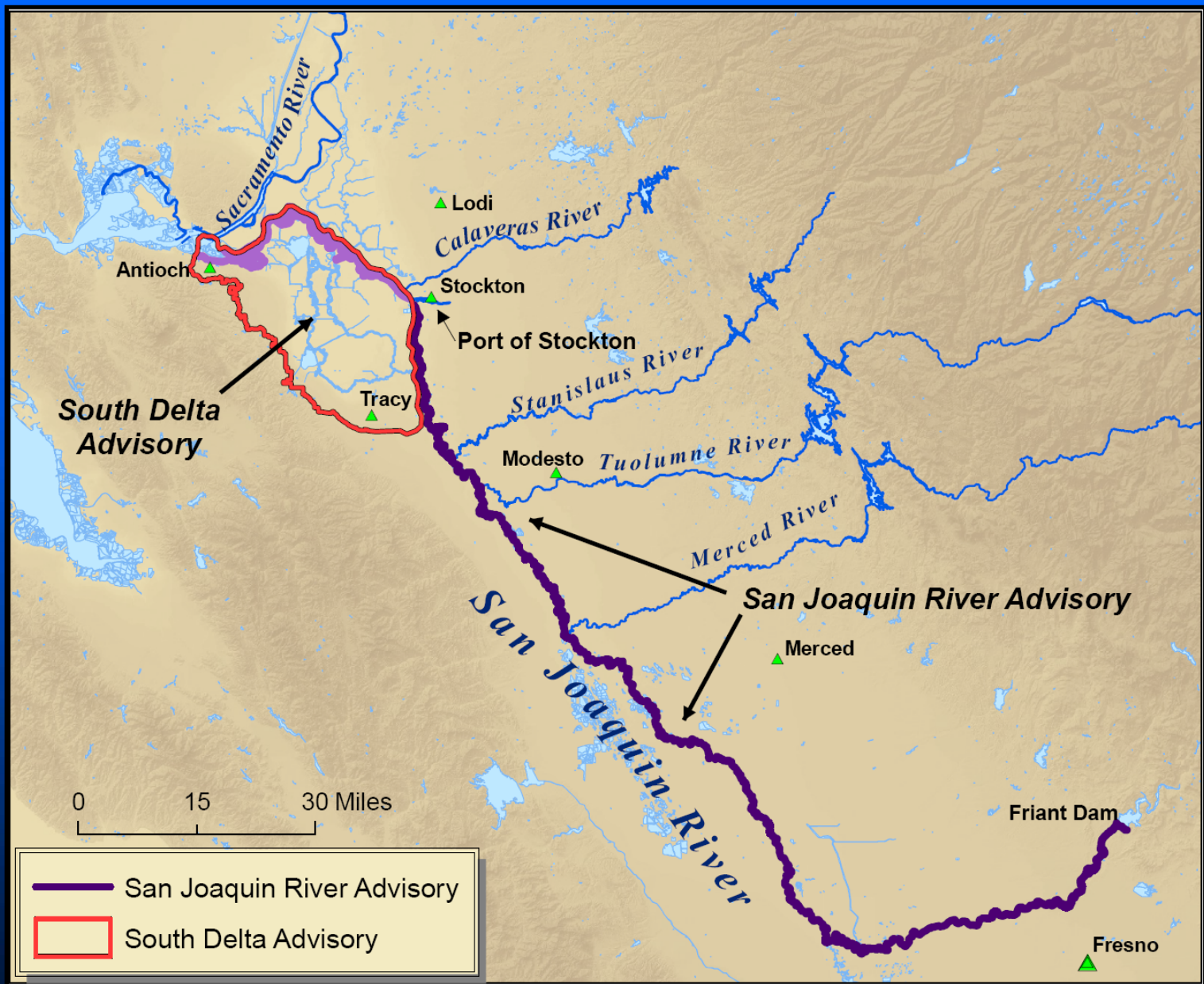
2007: Tributaries to the San Joaquin River and Various Reservoirs



**March 2007**

**Draft Safe Eating Guidelines  
for Fish and Shellfish  
from the San Joaquin River  
and “South Delta”**





## Draft Advisories for Two Regions



# Color Categories

## San Joaquin River and South Delta draft advisories

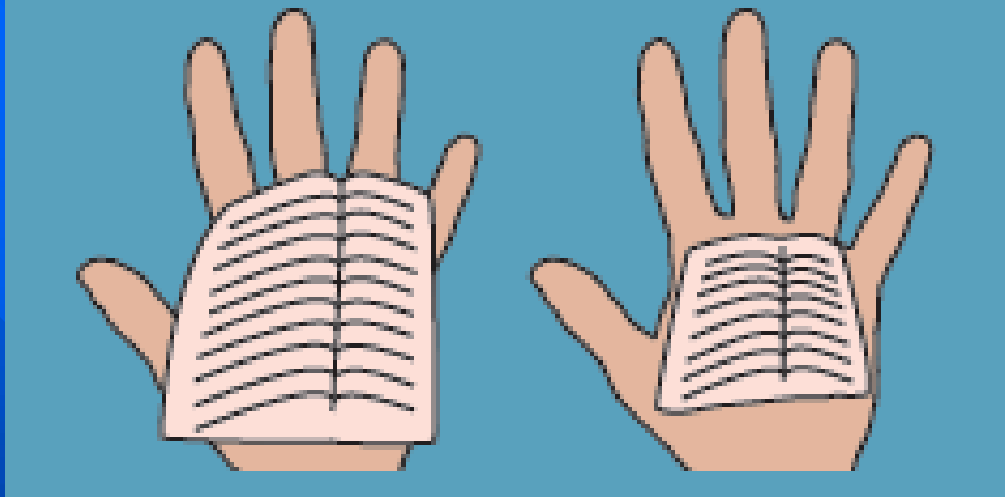
- All fish consumption that meets the American Heart Association recommendations of two (3-ounce) servings a week = **GREEN**
- If at least two (3-ounce) servings of fish can not be eaten in a week = **RED**

# Serving Sizes

## San Joaquin River and South Delta draft advisories

- **Smaller serving sizes were used**
  - To be consistent with nutritional guidance
  - 4 ounces of fish before cooking = 3 ounces of cooked fish = one adult serving
- **OEHHA received feedback to use 8-ounce servings**
- **New draft advisories use 8-ounce servings (6 ounces after cooking fish)**

# What is a serving?



**For Adults**

**For Children**

The recommended serving of fish is about the size and thickness of your hand. Use your hand to measure a serving of fish. Give children smaller servings.

# SAFE EATING GUIDELINES

Based on mercury in fish from the

## SOUTH DELTA

Including the San Joaquin River from the Sacramento River to the Port of Stockton, and all rivers, sloughs, and flooded tracts in the Delta south of the San Joaquin River



Women of Childbearing Age,  
Pregnant and Breastfeeding Women, and  
Children 17 Years and Younger



Women Beyond Childbearing Age  
and Men

### Best Choices

Bluegill and other sunfish, catfish, clams,  
or crayfish

**Eat up to 4 servings\* a week**  
(Total of 12 ounces cooked fish a week)

### Best Choices

Bluegill or other sunfish

**Daily**

(Total of 21 ounces cooked fish a week)

OR

Clams, crayfish, crappie, or carp

**Eat up to 6 servings\* a week**

(Total of 18 ounces cooked fish a week)

OR

Catfish; sucker; largemouth, smallmouth,  
or spotted bass

**Eat up to 4 servings\* a week**

(Total of 12 ounces cooked fish a week)

OR

### Good Choices

Crappie; carp; sucker; largemouth,  
smallmouth, or spotted bass

**Eat up to 2 servings\* a week**  
(Total of 6 ounces cooked fish a week)

### Avoid

Striped bass (18-27 inches) or sturgeon  
**No more than 2 servings\* a month**  
(Total of 6 ounces cooked fish a month)

Striped bass over 27 inches

**Do Not Eat**

### Avoid

Striped bass (18-35 inches) or sturgeon  
**No more than 4 servings\* a month**  
(Total of 12 ounces cooked fish a month)

Striped bass over 35 inches

**Do Not Eat**

Follow the "No Consumption" warnings where signs are posted  
for the Port of Stockton area

\* The recommended serving size for adults is three ounces of cooked fish (four ounces prior to cooking)

For more information, call OEHA at (510) 622-3170 or visit [www.oehha.ca.gov](http://www.oehha.ca.gov) and click on "Fish"

## SAFE EATING GUIDELINES

Based on mercury in fish from the

### SAN JOAQUIN RIVER

From the Port of Stockton to Friant Dam



Women of Childbearing Age,  
Pregnant and Breastfeeding Women, and  
Children 17 Years and Younger



Women Beyond Childbearing Age  
and Men

#### Best Choices

Bluegill and other sunfish, or crayfish  
**Eat up to 4 servings\* a week**  
(Total of 12 ounces cooked fish a week)

#### Best Choices

Bluegill or other sunfish  
**Daily**  
(Total of 21 ounces cooked fish a week)  
OR  
Crayfish, crappie, or carp  
**Eat up to 6 servings\* a week**  
(Total of 18 ounces cooked fish a week)  
OR  
Catfish or sucker  
**Eat up to 4 servings\* a week**  
(Total of 12 ounces cooked fish a week)

OR

OR

#### Good Choices

Catfish, crappie, carp, or sucker  
**Eat up to 2 servings\* a week**  
(Total of 6 ounces cooked fish a week)

#### Good Choices

Largemouth, smallmouth, or spotted bass  
**Eat up to 2 servings\* a week**  
(Total of 6 ounces cooked fish a week)

#### Avoid

Largemouth, smallmouth, or spotted bass  
**Do Not Eat**

Follow the "No Consumption" warnings where signs are posted for the Port of Stockton area

\* The recommended serving size for adults is three ounces of cooked fish (four ounces prior to cooking)

For more information, call OEHHHA at (510) 622-3170 or visit [www.oehha.ca.gov](http://www.oehha.ca.gov) and click on "Fish"



# San Francisco Bay-Delta Advice for Striped Bass and Sturgeon

Women ages 18-45 and children 1-17:

**Striped bass 27 inches or less or sturgeon:**

**1 serving a month – and no other fish that month**

**Striped bass over 27 inches: Do not eat**

Women over 45 years and men over 17:

**Striped bass 35 inches or less or sturgeon:**

**2 servings a month – and no other fish that month**

**Striped bass over 35 inches: Do not eat**

# Health Benefits from Eating Fish



# **FISH FACTS**

## **Nutrients in Fish**



- Fish provide protein and other essential nutrients (iron, selenium, vitamin E), and are lower in saturated fat
- Other animal protein (beef, pork) may increase your risk of some diseases
- Major source of “omega 3” fatty acids

# Benefits of Eating Fish and Omega 3s



- Studies show important health benefits from eating fish and from “omega 3s”
  - Prevents heart disease
  - Promotes development of nervous system
  - Promotes infant vision

Recent studies show that NOT eating fish during pregnancy may harm the baby

# Health Risks from Mercury in Fish

- The fetus and children are most at risk
  - The nervous system is most sensitive during development
  - The brain continues to develop through teenage years
  - Too much mercury can reduce the benefits



# Health Effects in Children

- **Subtle results seen in study**
  - **Used specialized tests of behavior**
    - No effect on IQ, coordination, reasoning, cognition (thinking)
    - Small effect on language, attention, memory
  - **Compared groups of children with different levels of exposure**
  - **Higher exposure associated with lower scores on some tests**

# Protect the Fetus and Children

## Balance the Benefits and Risks



Mercury passes to  
the baby

Omega 3s pass to  
the baby



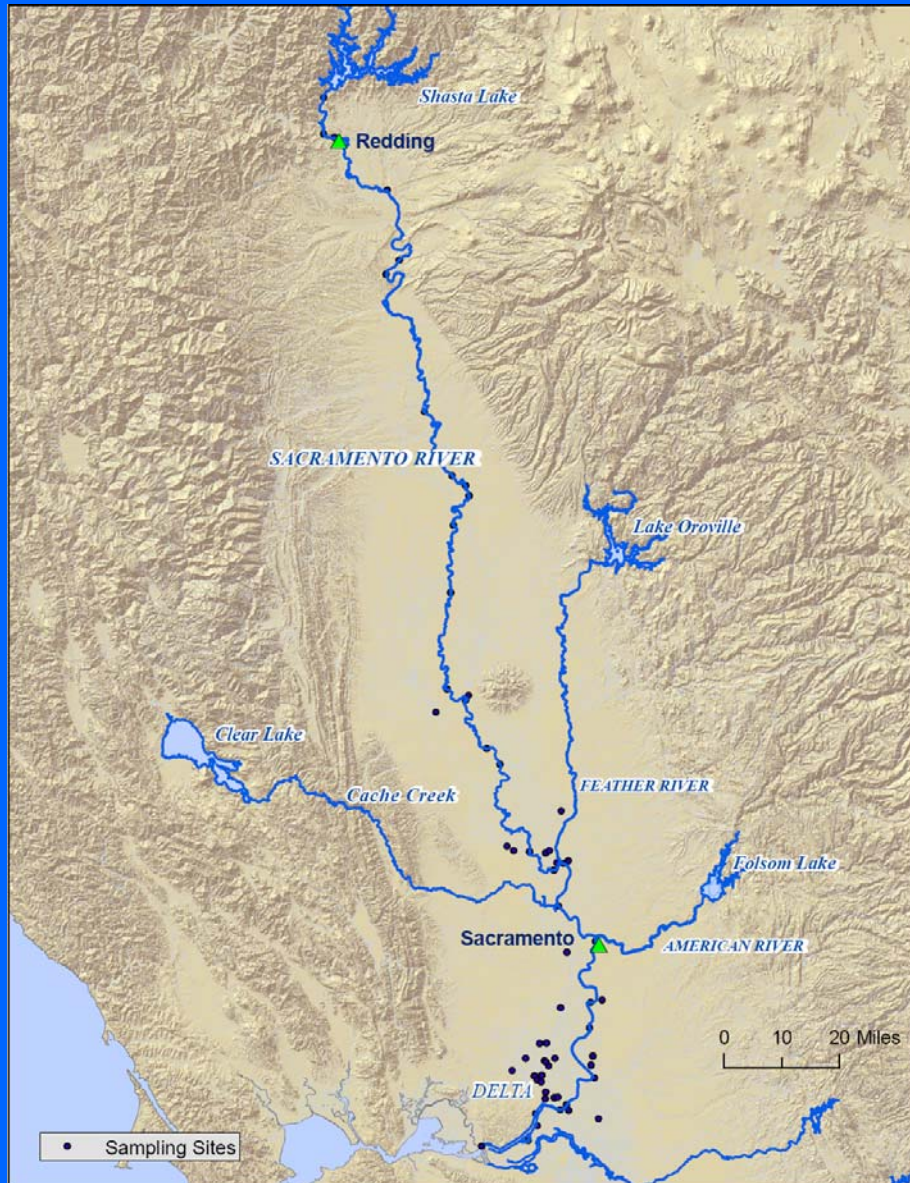
# Finding the Right Balance



# Mercury in Fish from the Sacramento River and Northern Delta

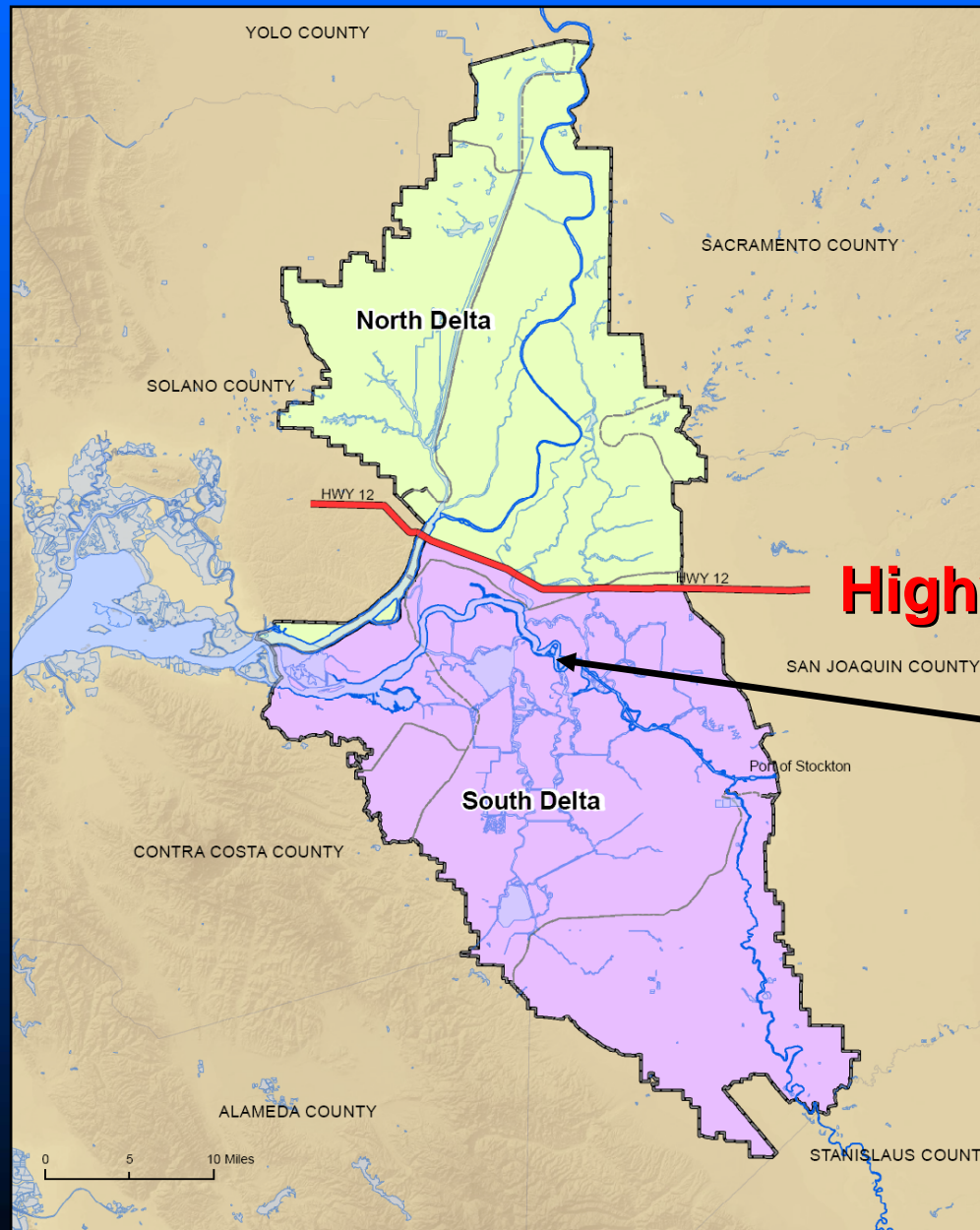
# STUDY AREA

## Sacramento River and Northern Delta





# Highway 12 is New Boundary for South Delta



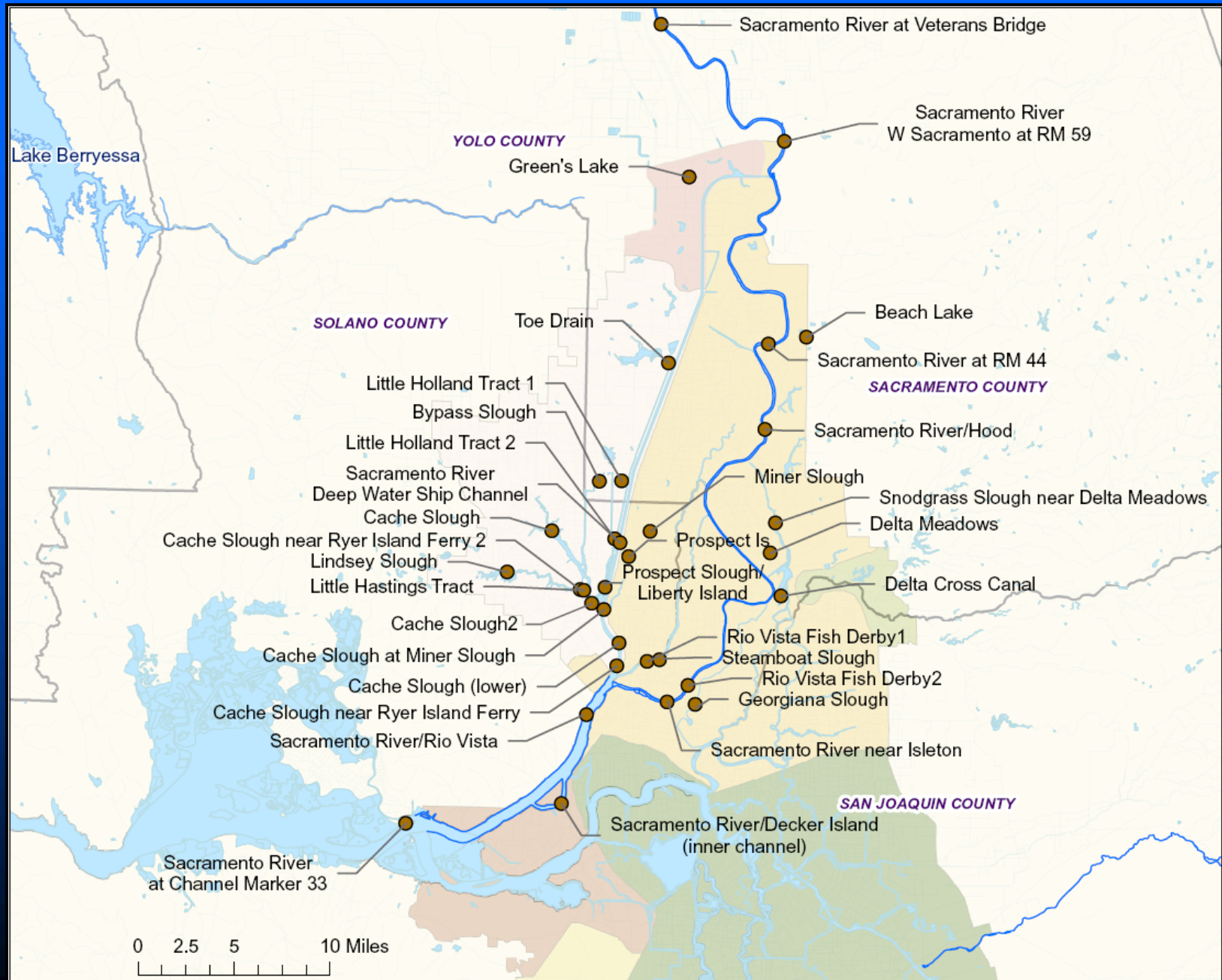
**Highway 12**

**Old Boundary  
(San Joaquin  
River)**

# New Names



# Northern Delta Sampling Sites



# Creeks and Sloughs Sampled

## In the Northern Delta:

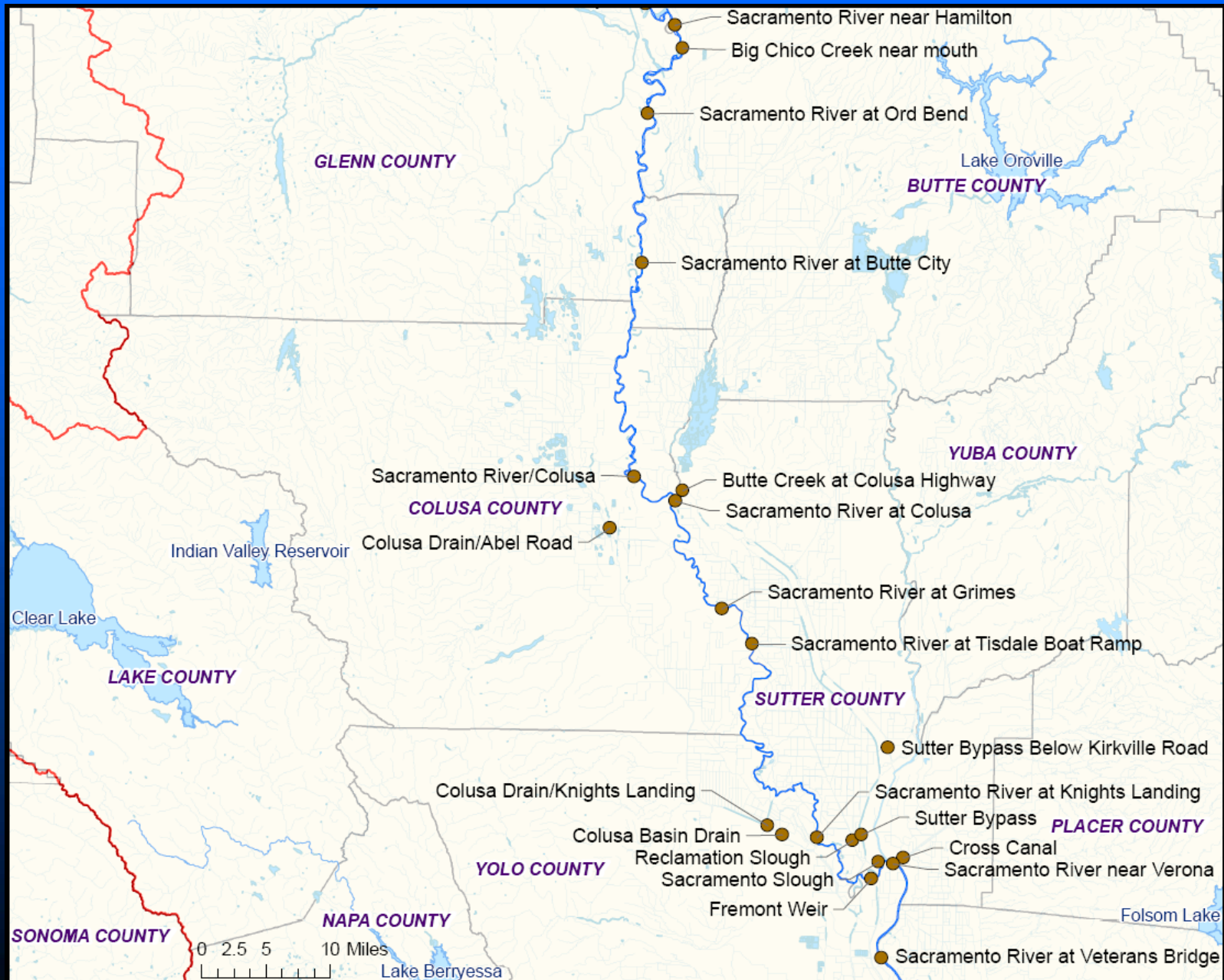
- Beach Lake
- Green's Lake
- Little Holland Tract
- Little Hastings Tract
- Delta Meadows
- Delta Cross Canal
- Toe Drain
- Deep Water Ship Channel
- Bypass, Cache, Georgiana, Lindsey, Miner, Prospect, Snodgrass, and Steamboat Sloughs

## Near the Sacramento River:

- Big Chico Creek
- Butte Creek
- Colusa Drain
- Sutter Bypass
- Cross Canal
- Reclamation Slough
- Sacramento Slough

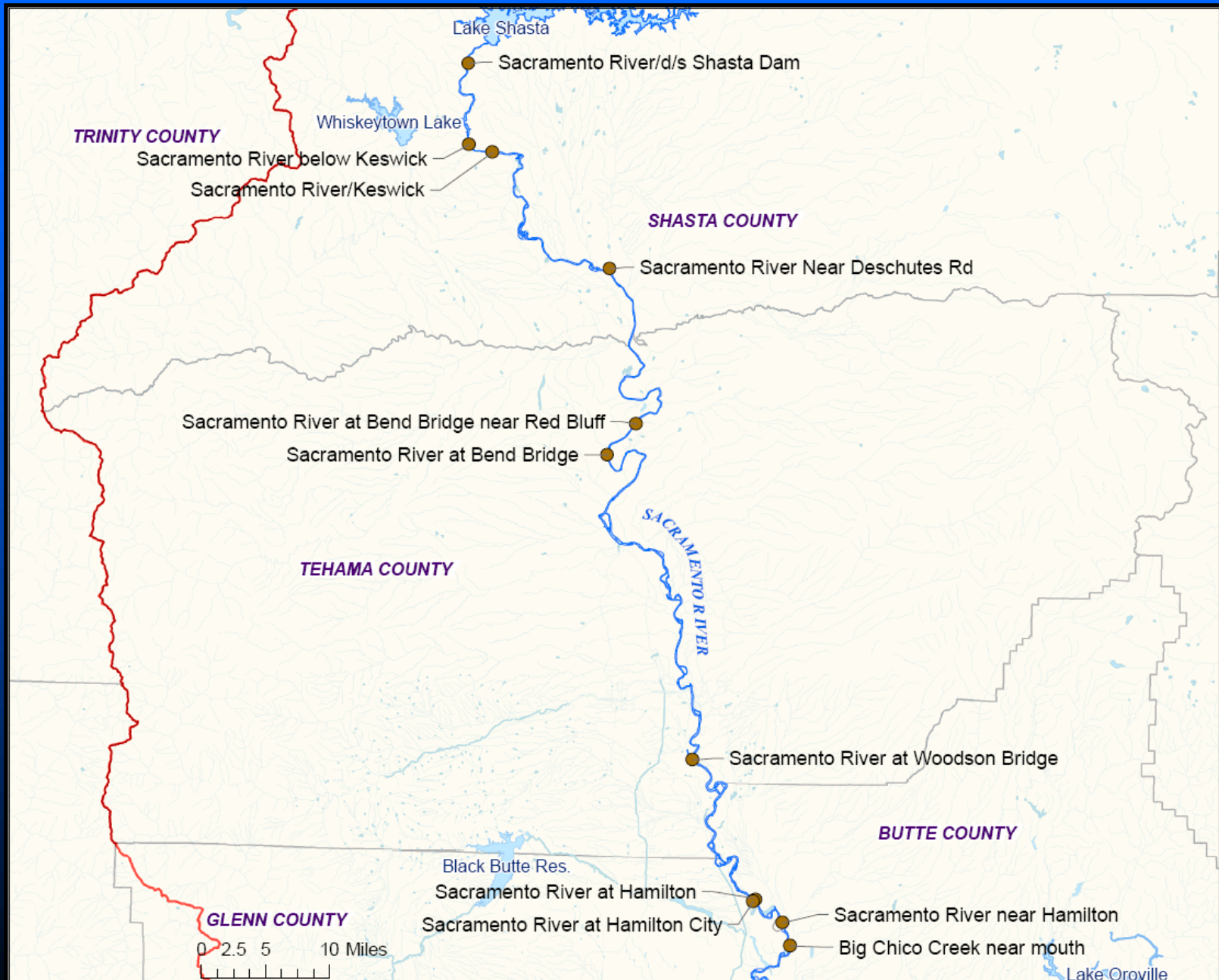


# Sacramento River Sampling Sites – north of Delta
























# Sacramento River Sampling Sites – farther north



# Average Mercury Levels

| <i><b>FISH &amp; SHELLFISH</b></i>   | <i><b>MERCURY<br/>(ppm)</b></i> |
|--|---------------------------------|
| Clams                            | <b>.02</b>                      |
| Rainbow trout<br>Steelhead trout  | <b>.14</b><br><b>.07</b>        |
| American shad                    | <b>.07</b>                      |
| Salmon                            | <b>.07</b>                      |
| Sucker                          | <b>.16</b>                      |
| Sunfish                        | <b>.19</b>                      |
| Crayfish                        | <b>.20</b>                      |

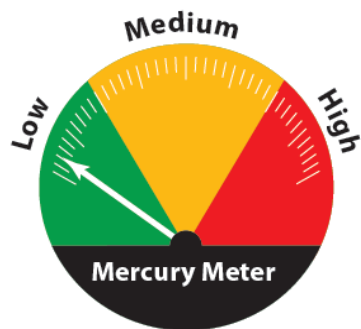
# Average Mercury Levels

| <i><b>FISH &amp; SHELLFISH</b></i>  | <i><b>MERCURY<br/>(ppm)</b></i>                      |
|---|--|
| Carp <br>Goldfish <br>Hardhead <br>Hitch  | <b>.24</b><br><b>.26</b><br><b>.26</b><br><b>.26</b> |
| Crappie    | <b>.33</b>   |
| Catfish     | <b>.38</b>   |
| Pikeminnow   | <b>.44</b>   |
| Largemouth, smallmouth, and spotted bass     | <b>.65</b>   |

# Draft Safe Eating Guidelines for the Sacramento River and Northern Delta

# A guide to eating fish caught in the northern Delta and Sacramento River

For women ages 18 - 45, especially those who are pregnant or breastfeeding, and children ages 1 - 17



American Shad



Asiatic Clam

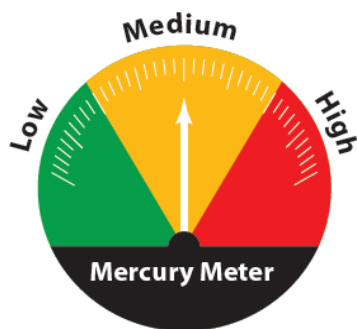


Trout ♥



Salmon ♥

♥ = High in Omega 3s



Carp and Goldfish



Sucker



Crappie



Catfish



Sunfish



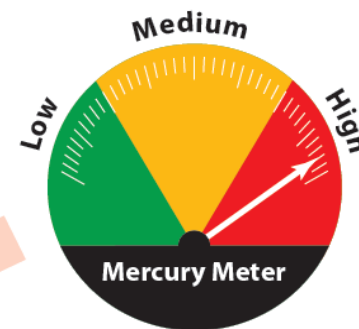
Hitch



Hardhead



Crayfish



Striped Bass\*



Largemouth Bass



Sturgeon\*



Pikeminnow

Safe to eat  
3 servings per week

OR

Safe to eat  
1 serving per week

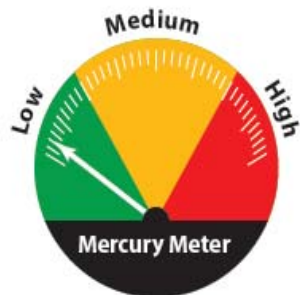
**Do not eat**

\*Striped bass under 27 inches or sturgeon:  
safe to eat 1 serving per month.



# A guide to eating fish caught in the northern Delta and Sacramento River

Women over 45 and men over 17



American Shad



Asiatic Clam

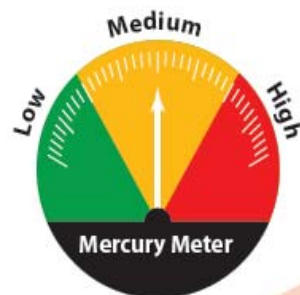


Trout ♥



Salmon ♥

♥ = High in Omega 3s



Carp and Goldfish



Sucker



Crappie



Catfish



Hitch



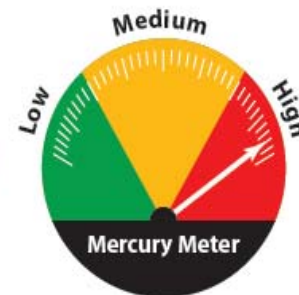
Sunfish



Crayfish



Hardhead



Striped Bass\*



Largemouth Bass



Sturgeon\*



Pikeminnow

Safe to eat 1 serving daily

OR

Safe to eat  
3 servings per week

OR

Safe to eat 1 serving per week

\*Striped bass under 35 inches or sturgeon:  
safe to eat 2 servings per month.

Do not eat striped bass over 35 inches



# **Striped Bass and Sturgeon**

- A special study of striped bass is underway
- Advice will be updated when completed
- Until then:

**Follow the guidelines for the  
San Francisco Bay-Delta advisory**



# Acknowledgements

California Department of Public Health (CDPH)

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# Thank you!

## Comments welcome through May 27, 2008:

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**<http://oehha.ca.gov>**

**Click on “Fish”**

# Water Bodies with Fish Consumption Advisories

## Office of Environmental Health Hazard Assessment



### Advisories in Northern Sierra Nevada Foothill Counties (1)



### Advisory Chemical

- (1) = mercury
- (2) = PCBs
- (3) = DDT
- (4) = selenium
- (5) = chlordane

### Freshwater Advisories in San Francisco Bay Area Counties (1)

